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Indian Standard
SPECIFICATION FOR *BOMBAY HALWA*
(First Revision)

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NEW DELHI 110002

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Indian Standard
SPECIFICATION FOR *BOMBAY HALWA*
(First Revision)

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Indian Standard

SPECIFICATION FOR *BOMBAY HALWA*

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 26 February 1975, after the draft finalized by the Bakery and Confectionery Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 This standard was first published in April 1964. In view of the experience gained in the manufacture of *BOMBAY HALWA*, the committee responsible for formulation of this specification decided to revise it. In this revision requirements for various characteristics have been reviewed and requirement for quantity of nuts has been modified. In addition the use of tin containers which may be either lacquered or unlacquered has been permitted. This revision also incorporates two amendments issued earlier.

0.3 *BOMBAY HALWA* is a favourite item of Indian sweetmeats. It is made from maize starch, ghee, sugar and nuts. Colouring matter and flavouring essences are also added. *BOMBAY HALWA* is being exported to some foreign countries. In order to preserve the *HALWA* for a long time without deterioration, specially when exported to foreign countries, it is packed in hermetically sealed containers.

0.4 While formulating this standard due consideration has been given to the relevant rules issued by the Government of India under the Prevention of Food Adulteration Act, 1954. This standard is, however, subject to the restrictions imposed under that Act, wherever applicable.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for *BOMBAY HALWA*.

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*Rules for rounding off numerical values (*revised*).

2. INGREDIENTS

2.1 In the manufacture of *BOMBAY HALWA*, the following ingredients shall be used.

2.1.1 *Edible Maize Starch* — conforming to IS : 1005-1969*.

2.1.2 *Ghee* (*Butter Fat*) — conforming to the standards prescribed under PFA Rules and free from rancidity and objectionable odour.

2.1.3 *Sugar* — conforming to IS : 1151-1969† or IS : 498-1970‡.

2.1.4 *Almonds* — sweet and of good quality free from rancid odour and infestation, comminuted to small pieces or cut into halves, but not ground.

2.1.5 *Pistachio* — sweet and of good quality free from rancid odour and infestation, comminuted to small pieces or cut into halves, but not ground.

2.1.6 *Colouring and Flavouring Agents and Essences* — only those permitted within the provisions of PFA Rules. The colours and flavouring essences may be as agreed to between the purchaser and the vendor.

3. REQUIREMENTS

3.1 Description — *BOMBAY HALWA* shall be sweet, well set, soft and smooth in texture and shall not show sign of fat leaching out. It shall not have any objectionable taste or odour. The quantity of nuts, when determined by the method given in Appendix A, shall be not less than 2·0 percent by mass of the *HALWA*. The nuts shall be either fairly uniformly distributed within the body or spread on the top layer of the *HALWA*. The texture of *HALWA* shall be neither too hard nor too rubbery.

NOTE — The appearance, taste, flavour and odour shall be determined by organoleptic test.

3.2 *BOMBAY HALWA* shall be manufactured in premises using equipment maintained under hygienic conditions (*see* IS : 5059-1969§).

3.3 *BOMBAY HALWA* shall conform to the requirements prescribed in Table 1.

4. PACKING AND MARKING

4.1 Packing — The *BOMBAY HALWA* shall be packed in hermetically sealed tinplate containers which may be either lacquered or unlacquered, or in other suitable containers. The *HALWA* shall be wrapped in non-toxic grease-proof packaging material before being packed in the containers.

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*Specification for edible maize starch (corn flour) (*first revision*).

†Specification for refined sugar (*first revision*).

‡Specification for vacuum pan sugar (plantation white) (*third revision*).

§Code for hygienic conditions for large scale biscuit manufacturing units and bakery units.

TABLE 1 REQUIREMENTS FOR *BOMBAY HALWA*

(*Clause* 3.3)

Sl No.	Characteristic	Requirement	Method of Test, Ref to Appendix
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, *Max*	12·0	B
ii)	Fat (*see* Note), percent by mass, *Min*	6·0	C
iii)	Acidity of extracted fat (as oleic acid), percent by mass, *Max*	3·0	D
iv)	Sugars, expressed as sucrose, percent by mass, *Min*	55	E

Note — The fat used in the manufacture of *BOMBAY HALWA* shall be pure ghee. Its purity shall be tested on the basis of the requirements given in the Prevention of Food Adulteration Rules as amended from time to time. The Butyro refractometer reading, Reichert value and free fatty acid content shall be determined as per methods prescribed in IS : 3508-1966 Methods of sampling and test for ghee (butter fat).

4.2 Marking — The following particulars shall be marked or labelled on each container:

a) Name of the material;
b) Trade or brand name;
c) Name of the manufacturer;
d) Batch or code number;
e) Net mass; and
f) Statement 'Contains permitted colouring and flavouring agents', if added.

4.2.1 Each container may also be marked with the ISI Certification Mark.

Note — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

5. SAMPLING

5.1 Representative samples of the *BOMBAY HALWA* shall be drawn as prescribed in Appendix F.

6. TESTS

6.1 Tests shall be carried out as prescribed in the appropriate appendices specified in col 4 of Table 1.

6.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1960*) shall be employed in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the experimental results.

APPENDIX A

(*Clause* 3.1)

DETERMINATION OF QUANTITY OF NUTS

A-1. PROCEDURE

A-1.1 Weigh the entire content of the container (approx 250 g) accurately. Pick out pieces of almonds and pistachio nuts and wipe them with filter paper or clean cloth. Weigh the nuts so collected and calculate the percentage of nuts from the mass of the nuts, picked out.

APPENDIX B

[*Table* 1, *Item* (i)]

DETERMINATION OF MOISTURE

B-1. PREPARATION OF SAMPLE

B-1.1 Immediately before the test, mince as quickly as possible with a sharp-edged knife 50 g of the sample on a clean porcelain slab. Mix thoroughly to secure a uniform sample. Store the minced sample immediately in an air-tight glass container.

B-2. PROCEDURE

B-2.1 Heat the metal dish (with cover) containing 20 g of prepared sand in the oven for about 30 minutes. Allow to cool in a desiccator and weigh. Weigh accurately about 10 g of the prepared sample (**B-1.1**) in the aforesaid dish. Add few drops of distilled water and thoroughly mix the wet sand with the *BOMBAY HALWA* stirring with a glass rod. Spread the mixture over the bottom of the dish. Transfer back the adhering particle of mixture or sand from the glass rod to the dish. Heat the dish after uncovering it in an oven maintained at 100±2°C for about 5 hours. Cool in a desiccator and weigh with cover on. Heat the dish again for 30 minutes, cool and weigh. Repeat the process until the difference between two consecutive weighings is less than one milligram. Record the lowest mass.

---

*Specification for water, distilled quality (*revised*).

B-3. CALCULATION

B-3.1 Moisture, percent by mass $= \dfrac{100\,(M_1 - M_2)}{M_1 - M}$

where

M_1 = mass in g of the dish with the material before drying,
M_2 = mass in g of the dish with the material after drying, and
M = mass in g of the dish.

APPENDIX C

[*Table* 1, *Item* (ii)]

DETERMINATION OF FAT

C-1. APPARATUS

C-1.1 Soxhlet Extraction Apparatus

C-2. SOLVENT

C-2.1 Petroleum Ether — distilling below 60°C.

C-3. PROCEDURE

C-3.1 Weigh accurately about 10 g of the sample from which the nut pieces have already been picked out in a flat aluminium dish. Mix thoroughly with about 20 g of dry sand with the help of a glass rod and dry at 105 ± 2°C for 4 hours. Transfer carefully the dried material into the thimble with the help of a glass rod taking care to see that all adhering particles are transferred to the thimble. Wash the glass rod and the dish with petroleum ether twice or thrice transferring the ether into the extractor. Extract in the Soxhlet extraction apparatus for about 16 hours using petroleum ether as solvent. Dry the extract contained in the Soxhlet flask, the empty mass of which has been previously determined, at 95 to 100°C for 30 minutes. Cool in a desiccator and weigh. Continue the process of drying for about 30 minutes, cooling and weighing until the loss in mass between two consecutive weighings is not more than one milligram. Record the lowest mass.

C-4. CALCULATION

C-4.1 Fat, percent by mass $= \dfrac{10\,000\,(M_1 - M_2)}{M\,(100 + N)}$

where

M_1 = mass in g of the Soxhlet flask with the extracted fat,
M_2 = mass in g of the empty Soxhlet flask,
M = mass in g of the material taken for the test, and
N = the percentage by mass of nuts as determined in Appendix A.

APPENDIX D

[*Table* 1, *Item* (iii)]

DETERMINATION OF ACIDITY OF EXTRACTED FAT

D-1. APPARATUS

D-1.1 Soxhlet Extraction Apparatus — with a 250-ml flat-bottom flask.

D-2. REAGENTS

D-2.1 Petroleum Ether — distilling below 60°C.

D-2.2 Ethyl Alcohol — 95 percent by volume, or rectified spirit (*see* IS : 323-1959*) neutral to phenolphthalein indicator.

D-2.3 Phenolphthalein Indicator Solution — one percent (*m/v*) solution in ethyl alcohol or rectified spirit.

D-2.4 Standard Potassium Hydroxide Solution — 0·1 N.

D-3. PROCEDURE

D-3.1 Extraction of Fat — Take approximately about 50 g of the sample and remove the pieces of nuts contained in it. Dry in an air-oven at 105 ± 2°C for 4 hours. Mix thoroughly the *HALWA* freed from nuts with about 20 g of dried sand and transfer to the thimble of the Soxhlet apparatus and extract with petroleum ether for 2 hours. Evaporate the ether slowly in a water-oven. Dry the flask at 100 ± 5°C for five hours and cool.

D-3.2 Determination of Acidity — Weigh by transference accurately 2·5 to 3·0 g of the extracted fat (*see* **D-3.1**) into a 200-ml conical flask. Add approximately 25 ml of hot ethyl alcohol and about one millilitre of the phenolphthalein indicator solution, and titrate the mixture while hot with the standard potassium hydroxide solution. Take the first pink colouration, persisting for 30 seconds during shaking as the end point.

D-4. CALCULATION

D-4.1 Acidity of the extracted fat (as oleic acid), percent by mass $= \dfrac{28{\cdot}2\, VN}{M}$

where

V = volume in ml of the standard potassium hydroxide solution used,

N = normality of the standard potassium hydroxide solution, and

M = mass in g of the extracted fat taken for the test (*see* **D-3.2**).

---

*Specification for rectified spirit (*revised*).

APPENDIX E

[*Table* 1, *Item* (iv)]

DETERMINATION OF SUGARS

E-1. REAGENTS

E-1.1 Alcohol — 70 percent (*v*/*v*) of ethyl alcohol.

E-1.2 Sodium Hydroxide Solution — 30 percent (*m*/*v*).

E-1.3 Concentrated Hydrochloric Acid — sp gr 1·16 of analytical reagent grade (*see* IS : 265-1962*).

E-1.4 Stock Solution of Dextrose—Weigh accurately 10 g of anhydrous dextrose into a one-litre graduated flask and dissolve it in water. Add to this solution 2·5 g of benzoic acid, shake to dissolve the benzoic acid and make up the volume to the mark with water. (This solution should not be used when more than 48 hours old.)

E-1.5 Standard Dextrose Solution — Dilute a known aliquot of the stock solution of dextrose (**E-1.4**) with water containing 0·25 percent (*m*/*v*) of benzoic acid to such a concentration, that more than 15 ml but less than 50 ml of it will be required to reduce all the copper in the Fehling's solution taken for titration. Note the concentration of anhydrous dextrose in this solution as milligrams per 100 ml (*see* Note). Prepare this solution fresh every day.

NOTE — When 10 ml (*see also* **E-3.1.1**) of Fehling's solution is taken for titration, a standard dextrose solution containing 0·11 to 0·30 percent (*m*/*v*) of anhydrous dextrose is convenient for use.

E-1.6 Methylene Blue Indicator Solution — Dissolve 0·2 g of methylene blue in water and dilute to 100 ml.

E-1.7 Fehling's Solution (Soxhlet Modification) — prepared by mixing immediately before use, equal volumes of Solution A and Solution B.

E-1.7.1 *Solution A* — Dissolve 34·639 g of copper sulphate ($CuSO_4$, $5H_2O$) in water, add 0·5 ml of concentrated sulphuric acid of sp gr 1·84 (conforming to analytical reagent grade of IS : 266-1961†) and dilute to 500 ml in a graduated flask. Filter the solution through prepared asbestos.

E-1.7.2 *Solution B* — Dissolve 173 g of Rochelle salt [potassium sodium tartrate ($KNaC_4H_4O_6$, $4H_2O$)] and 50 g of sodium hydroxide, analytical reagent grade (conforming to IS : 376-1952‡) in water, dilute to 500 ml in a graduated flask and allow the solution to stand for two days. Filter the solution through prepared asbestos.

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*Specification for hydrochloric acid (*revised*).

†Specification for sulphuric acid (*revised*).

‡Sodium hydroxide, analytical reagent (*first revision*).

E-1.7.3 *Standardization of Fehling's Solution* — Pour standard dextrose solution (*see* **E-1.5**) into a 50-ml burette (*see* Note 3 under **E-2.3**). Find the titre (that is, the volume of standard dextrose solution required to reduce all the copper in 10 ml of Fehling's solution) corresponding to the concentration of standard dextrose solution from Table 2. If, for example, the standard dextrose solution contains 167·0 mg of anhydrous dextrose per 100 ml, the corresponding titre would be 30 ml. Pipette 10 ml (*see also* **E-3.1.1**) of Fehling's solution into a 300-ml conical flask and run in from the burette almost the whole of the standard dextrose solution required to effect reduction of all the copper, so that not more than one millilitre will be required later to complete the titration. Heat the flask containing the mixture over a wire gauze. Gently boil the contents of the flask for 2 minutes. At the end of 2 minutes of boiling, add one millilitre of methylene blue indicator solution without interrupting boiling. While the contents of the flask continue to boil, begin to add standard dextrose solution (one or two drops at a time) from the burette till the blue colour of the indicator just disappears. [The titration should be completed within one minute, so that the contents of the flask boil altogether for 3 minutes without interruption (*see* Note 2 under **E-2.3**).] Note the titre (that is, the total volume in millilitres of standard dextrose solution used for the reduction of all the copper in 10 ml of Fehling's solution). Multiply the titre (obtained by direct titration) by the number of milligrams of anhydrous dextrose in one millilitre of the standard dextrose solution to obtain the dextrose factor. Compare this factor with the dextrose factor given in Table 2 and determine correction, if any, to be applied to the dextrose factor derived from Table 2.

Example:

Concentration in mg/100 ml of anhydrous dextrose in standard dextrose solution = 167·0

Titre in ml obtained by direct titration = 30·1

Dextrose factor for 30·1 ml of standard dextrose solution = titre in ml × number of mg of anhydrous dextrose in one millilitre of standard dextrose solution
= $30\cdot1 \times 1\cdot670$
= 50·267 0

Dextrose factor for 30·1 ml of standard dextrose solution from Table 2 (calculated by interpolation) = 50·11

Correction to be applied to the dextrose factor derived from Table 2 = 50·267 0 −50·11
= +0·157 0

TABLE 2 DEXTROSE FACTORS FOR 10 ml OF FEHLING'S SOLUTION

(*Clause* E-1.7.3)

TITRE (1) ml	DEXTROSE FACTOR* (2)	DEXTROSE CONTENT PER 100 ml OF SOLUTION (3) mg
15	49·1	327·0
16	49·2	307·0
17	49·3	289·0
18	49·3	274·0
19	49·4	260·0
20	49·5	247·4
21	49·5	235·8
22	49·6	225·5
23	49·7	216·1
24	49·8	207·4
25	49·8	199·3
26	49·9	191·8
27	49·9	184·9
28	50·0	178·5
29	50·0	172·5
30	50·1	167·0
31	50·2	161·8
32	50·2	156·9
33	50·3	152·4
34	50·3	148·0
35	50·4	143·9
36	50·4	140·0
37	50·5	136·4
38	50·5	132·9
39	50·6	129·6
40	50·6	126·5
41	50·7	123·6
42	50·7	120·8
43	50·8	118·1
44	50·8	115·5
45	50·9	113·0
46	50·9	110·6
47	51·0	108·4
48	51·0	106·2
49	51·0	104·1
50	51·1	102·2

*Milligrams of anhydrous dextrose corresponding to 10 ml of Fehling's solution.

E-2. PROCEDURE

E-2.1 Preparation of the Solution — Weigh accurately about 10 g of *BOMBAY HALWA* in a 150-ml beaker. Triturate with hot alcohol. Filter through a dry filter the hot alcoholic extract containing the free reducing sugar and the sucrose into a basin. Wash the filter thoroughly with small quantities of hot alcohol through the beaker until the filtrate is free from sucrose. Keep the filtrate in the basin on a water-bath to remove all the alcohol. Dissolve the residue which consists of all the sugars in distilled water and make up the volume to 100 ml in a standard volumetric flask. Take 10 ml of this solution in a conical flask and add 1·5 ml of the concentrated hydrochloric acid and about 10 ml of water. Heat the flask for

10 minutes on a water-bath maintained at 60 to 70°C. Cool immediately and neutralize with sodium hydroxide solution and transfer quantitatively the neutralized inverted solution to a graduated flask and make up the volume to 100 ml.

E-2.2 Incremental Method of Titration — Pour the prepared solution (*see* **E-2.1**) into a 50-ml burette (*see* Note 3 under **E-2.3**). Pipette 10 ml of Fehling's solution into a 300-ml conical flask and run in from the burette 15 ml of the prepared solution. Without further dilution, heat the contents of the flask over a wire gauze, and boil. (After the liquid has been boiling for about 15 seconds, it will be possible to judge if almost all the copper is reduced by the bright red colour imparted to the boiling liquid by the suspended cuprous oxide.) When it is judged that nearly all the copper is reduced, add one millilitre of methylene blue indicator solution (*see* Note 1). Continue boiling the contents of the flask for one to two minutes from the commencement of ebullition, and then add the prepared solution in small quantities (one millilitre or less at a time), allowing the liquid to boil for about 10 seconds between successive additions, till the blue colour of the indicator just disappears (*see* Note 2 under **E-2.3**). In case there still appears to be much unreduced copper after the mixture of Fehling's solution with 15 ml of the prepared solution has been boiling for 15 seconds, add the prepared solution from the burette in larger increments (more than one millilitre at a time according to judgement), and allow the mixture to boil for 15 seconds after each addition. Repeat the addition of the prepared solution at intervals of 15 seconds until it is considered unsafe to add a large increment of the prepared solution. At this stage, continue the boiling for an additional one to two minutes, add one millilitre of methylene blue indicator solution and complete the titration by adding the prepared solution in small quantities (less than one millilitre at a time) (*see also* Note 2).

NOTE 1 — It is advisable not to add the indicator until the end point has been nearly reached because the indicator retains its full colour until the end point is almost reached and thus gives no warning to the operator to go slowly.

NOTE 2 — When the operator has had a fair amount of experience with the method, a sufficiently accurate result may often be obtained by a single estimation by the incremental method of titration. For the utmost degree of accuracy of which the method is capable, a second titration should be carried out by the standard method of titration (*see* **E-2.3**).

E-2.3 Standard Method of Titration — Pipette 10 ml of Fehling's solution into a 300-ml conical flask and run in from the burette almost the whole of the prepared solution required to effect reduction of all the copper (determined under **E-2.2**), so that if possible, not more than one millilitre will be required later to complete the titration. Gently boil the contents of the flask for 2 minutes. At the end of 2 minutes of boiling, add without interrupting boiling, one millilitre of methylene blue indicator solution. While the contents of the flask continue to boil, begin to add the prepared solution (one or two drops at a time) from the burette till the blue colour of the indicator just disappears (*see* Note 1). [The titration should be completed within one minute so that the contents of the flask boil altogether for 3 minutes without interruption (*see* Note 2).]

In case of doubt, the flame may be removed from the wire gauze for one or two seconds and the flask held against a sheet of white paper. (A holder of paper, suitably fixed round the neck of the flask, is very convenient for this purpose as it can be left round the neck of the flask without risk of over balancing it.) The top edge of the liquid would appear bluish if the indicator is not completely decolourized. It is inadvisable to interrupt the boiling as the indicator undergoes back oxidation rather rapidly when air is allowed free access into the flask, but there is no danger of this as long as a continuous stream of steam is issuing from the mouth of the flask.

NOTE 1 — The indicator is so sensitive that it is possible to determine the end point within one drop of the prepared solution in many cases. The complete decolouration of the methylene blue is usually indicated by the whole reaction liquid, in which the cuprous oxide is continuously churned up, becoming bright red or orange in colour.

NOTE 2 — It should be observed that with both incremental and standard methods of titration, the flask containing the reaction mixture is left on the wire gauze over the flame throughout the titration.

NOTE 3 — In adding sugar solution to the reaction mixture, the burette may be held in hand over the flask. The burette may be fitted with a small outlet tube bent twice at right angles, so that the body of the burette can be kept out of the steam while adding sugar solution. Burettes with glass taps are unsuitable for this work, as the taps become heated by the steam and are liable to jam.

E-3. CALCULATION

E-3.1 Refer to Table 2 for the dextrose factor corresponding to the titre (determined as given under **E-2.3**) and apply the correction previously determined under **E-1.7.3**. Calculate the dextrose content of the prepared solution (*see* **E-2.1**) as follows:

$$\text{Milligrams of anhydrous dextrose present in one millilitre of the prepared solution, } m = \frac{\text{Dextrose factor}}{\text{Titre}}$$

E-3.1.1 Instead of using 10 ml of Fehling's solution, a 25-ml portion may also be substituted throughout the procedure (including "Standardization of Fehling's Solution" under **E-1.7.3**). In this case the standard dextrose solution, used in standardizing the Fehling's solution and the prepared solution of the material (*see* **E-2.1**) shall contain 0·25 to 0·75 percent (*m/v*) of anhydrous dextrose, and Table 3 shall be used for all calculations.

E-3.2 Total sugars, expressed as sucrose, percent by mass $= \frac{m}{M} \times 10 \times 0{\cdot}95$

where

m = milligrams of anhydrous dextrose in one ml of the solution of the material (*see* **E-3.1**), and

M = mass in g of the prepared sample used for making 100 ml of solution (*see* **E-2.1**).

TABLE 3 DEXTROSE FACTORS FOR 25 ml OF FEHLING'S SOLUTION

(*Clause* E-3.1.1)

TITRE (1) ml	DEXTROSE FACTOR* (2)	DEXTROSE CONTENT PER 100 ml OF SOLUTION (3) mg
15	120·2	801·0
16	120·2	751·0
17	120·2	707·0
18	120·2	668·0
19	120·3	638·0
20	120·3	601·5
21	120·3	572·9
22	120·4	547·3
23	120·4	523·6
24	120·5	501·9
25	120·5	482·0
26	120·6	463·7
27	120·6	446·8
28	120·7	431·1
29	120·7	416·4
30	120·8	402·7
31	120·8	389·7
32	120·8	377·6
33	120·9	366·3
34	120·9	355·6
35	121·0	345·6
36	121·0	336·3
37	121·1	327·4
38	121·2	318·8
39	121·2	310·7
40	121·2	303·1
41	121·3	295·9
42	121·4	289·0
43	121·4	282·4
44	121·5	276·1
45	121·5	270·1
46	121·6	264·3
47	121·6	258·8
48	121·7	253·5
49	121·7	248·4
50	121·8	243·6

*Milligrams of anhydrous dextrose corresponding to 25 ml of Fehling's solution.

APPENDIX F

(*Clause* 5.1)

SAMPLING OF *BOMBAY HALWA*

F-1. GENERAL REQUIREMENTS OF SAMPLING

F-1.0 In drawing, preparing, storing and handling samples, the following precautions and directions shall be observed.

F-1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

F-1.2 The sampling instrument shall be clean and dry when used.

F-1.3 The samples, the material being sampled, the sampling instrument and the containers for collecting and storing the samples shall be protected from adventitious contamination.

F-1.4 The samples shall be placed in clean and dry glass containers. The sample containers shall be of such a size that they are almost completely filled by the sample.

F-1.5 Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment.

F-1.6 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature and that they are protected from light.

F-1.7 Sampling shall be done by a person agreed to between the purchaser and the vendor and in the presence of the purchaser (or his representative) and the vendor (or his representative).

F-2. SCALE OF SAMPLING

F-2.1 Lot — All the containers in a single consignment of the material drawn from a single batch of manufacture shall constitute a lot. If the consignment consists of different batches of manufacture, the containers belonging to the same batch of manufacture shall be separated and shall constitute separate lots.

F-2.2 For ascertaining the conformity of the lot to the requirements of the specification, tests shall be carried out for each lot separately. The number of containers to be selected for the purpose shall depend on the size of the lot (N) and shall be in accordance with Table 4.

F-2.3 The containers to be selected for sampling shall be chosen at random from the lot and for this purpose random number tables shall be used. In case such tables are not available, the following procedure may be adopted.

F-2.3.1 Starting from any container, count them as 1, 2, 3, ... up to r. Every rth container thus counted shall be withdrawn; r being the integral part of N/n where N and n are the lot size and the sample size respectively.

F-2.4 Samples for Determination of Quantity of Nuts — Three containers shall be selected from each lot apart from the containers chosen as per Table 4. One of these containers is for the purchaser, the other for the vendor and the third for the referee.

F-3. TEST SAMPLES AND REFEREE SAMPLES

F-3.1 Draw with an appropriate sampling instrument, about 300 g of the material from different parts of each container selected (*see* **F-2.3**).

TABLE 4 NUMBER OF CONTAINERS TO BE SELECTED FOR SAMPLING

(*Clause* F-2.2)

LOT SIZE N (1)	NO. OF CONTAINERS TO BE SELECTED n (2)
Up *to* 15	3
16 to 40	4
41 „ 110	5
111 „ 300	6
301 „ 800	7
801 „ 1 300	8
Above 1 300	9

F-3.2 Preparation of Individual Samples — Thoroughly mince and mix all the portions of the material drawn from the same container. Take out about 100 g of the material and divide it into three equal parts. Each part so obtained shall constitute an individual sample representing the container and shall be transferred to sample container which shall be sealed air-tight and labelled with the particulars given in **F-1.5**. The individual samples so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container. One of these sets shall be marked for the purchaser, another for the vendor and the third for the referee.

F-3.3 Preparation of Composite Sample — From the mixed material from each selected container remaining after the individual samples have been taken, equal quantities of the material from each container shall be taken and mixed up together so as to form a composite sample weighing not less than 450 g. This composite sample shall be divided into three equal parts and transferred to clean dried containers made of glass or tinplate and labelled with the particulars given in **F-1.5**. One of these composite samples shall be for the purchaser, another for the vendor and the third for the referee.

F-3.4 Referee Samples — Referee samples shall consist of a set of individual samples (*see* **F-3.2**) and a composite sample (*see* **F-3.3**) marked for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place agreed to between the two.

F-4. NUMBER OF TESTS

F-4.1 Tests for moisture, percent by mass, shall be conducted individually on each of the samples constituting a set of individual samples (*see* **F-3.2**).

F-4.2 Tests for the remaining characteristics, namely, fat, acidity of extract fat and sugars, shall be conducted on the composite sample (*see* **F-3.3**).

F-4.3 Test for Determination of Quantity of Nuts — shall be conducted in the container chosen as per **F-2.4**.

F-5. CRITERIA FOR CONFORMITY

F-5.1 For Individual Samples — The lot shall be declared to have satisfied the requirements of moisture if each of the test results (*see* **F-4.1**) satisfies the relevant specification requirements.

F-5.2 For Composite Sample — The lot shall be declared to have satisfied the requirements of the remaining characteristics (*see* **F-4.2**) if the test results of the composite sample satisfy the corresponding relevant specification requirements.

F-5.3 For Quantity of Nuts — The lot shall be declared to have satisfied the requirements for quantity of nuts if the test result of quantity of nuts (*see* **F-4.3**) satisfies the relevant requirements given in **3**.

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